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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/666,593	09/19/2003	Brian B. Ginther	DKT03009	8542

42595 7590 09/23/2004

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EXAMINER

ROYAL, PAUL

ART UNIT PAPER NUMBER

3611

DATE MAILED: 09/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/666,593

Applicant(s)

GINTHER ET AL. 

Examiner

Paul Royal

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 Sept 03.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 September 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>9 July 2004</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. The preliminary amendment filed on 2 February 2004 has been entered.

Information Disclosure Statement

2. The information disclosure statement (IDS) submitted on 9 July 2004 has been considered by the examiner.

Drawings

3. The drawings are objected to because, in Figure 2, it is unclear which elements of the drawing are indicated reference numbers 152, 154, 158, 176, 172, 174, 140B and 140. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any

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portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

4. The disclosure is objected to because of the following informalities:

At page 19, line 19, there appears to be a typographical error where "54and" should be "54 and".

At page 19, lines 19-20, when first used, applicant should explain the initials "SAE" and "ISO".

Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-2, 5 and 7, 9-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shibahata (US 6,131,054) in view of Matsuno (US 5,742,917).

Shibahata teaches an apparatus for controlling yaw in a motor vehicle comprising, in combination:

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a rear axle having a pair of independently operable clutches (3_L , 3_R) adapted to drive a pair of rear axles (1_R , 1_L), and pair of rear tire and wheel assemblies (W_{RL} , W_{RR});

a plurality of speed sensors (S_5) for sensing speeds of a plurality of tire and wheel assemblies;

a steering angle sensor (S_3) detecting rotation of the steering column;

a lateral acceleration sensor (S_4); and

a microprocessor (U) adapted to received signals from said sensors and provide first and second independent signals for actuating said pair of clutches;

wherein the clutches include an electromagnetic operator (17_L , 17_R).

Shibahata does not teach an apparatus for controlling yaw in a motor vehicle including a yaw rate sensor and wherein the microprocessor includes means for detecting left and right oversteer and left and right understeer of the vehicle which includes a yaw rate sensor signal, sensing a throttle position of the vehicle, and arbitrating between outputs of traction controllers and a dynamics controller.

Matsuno teaches means for detecting left and right oversteer and left and right understeer of a vehicle which includes a yaw rate sensor (44) signal, wherein the microprocessor computes a yaw acceleration value (γ_n) and Yaw rate error signal ($\Delta\gamma$), see column 8, line 5-column 9, line-25, column 14, line 23 – column 15, line 49 and column 16, lines 4-23, senses a throttle position of the vehicle (see claim 17), and arbitrates between outputs of traction controllers and a dynamics controller, see column 17, lines 21 to column 18, line 2 (where the

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various control means of Matsuno such as estimating means, calculating means, and determining means are understood to perform the traction and dynamics control arbitrating process), to provide a vehicle with driving torque distribution control over a variety of running conditions.

It would have been obvious to one of ordinary skill at the time of the invention to modify the apparatus for controlling yaw in a motor vehicle of Shibahata to include a yaw rate sensor and wherein the microprocessor including means for detecting left and right oversteer and left and right understeer of said vehicle which includes a yaw rate sensor signal and wherein the microprocessor computes a yaw acceleration value and senses a throttle position of the vehicle, and arbitrates between outputs of traction controllers and a dynamics controller, as taught by Matsuno, to provide a vehicle with driving torque distribution control over a variety of running conditions.

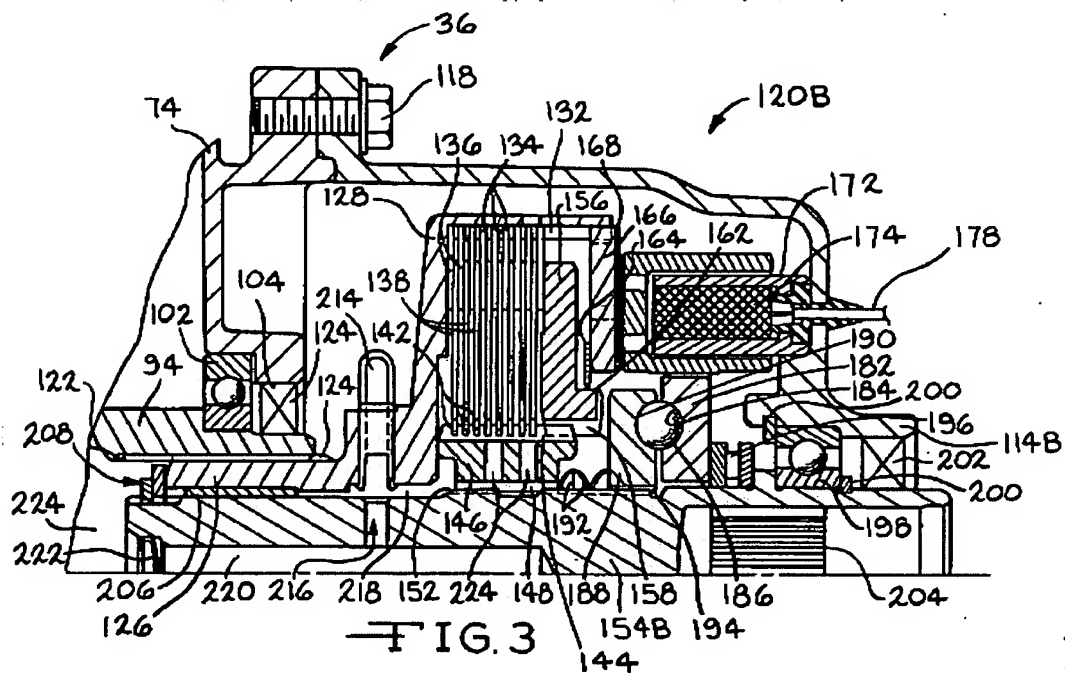
6. Claims 2-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shibahata and Matsuno, as applied to claim 1, in view of Knowles et al. (US 5,845,546).

Shibahata and Matsuno, as applied to claim 1, does not teach wherein each pair of clutches adapted to drive a pair of rear axles includes a ball ramp operator and a first driveline having a transaxle, a pair of front axles, a pair of front tire and wheel assemblies and driving a rear propshaft.

Knowles et al. teaches a multichamber twin clutch axle including wherein a pair of clutches (120A, 120B) having an electromagnetic operator (174), is

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adapted to drive a pair of rear axles (38) and includes a ball ramp operator (156, 158, 162), and a first driveline having a transaxle (14), a pair of front axles (26), a pair of front tire and wheel assemblies (28) and driving a rear propshaft (32), to provide a twin clutch axle which exhibits exceptional torque throughput and quiet operation.



Shown above is *KNOWELES ET AL., US 5,845,546, Figure 3*

It would have been obvious to one of ordinary skill at the time of the invention to modify the apparatus for controlling yaw in a motor vehicle of Shibahata and Matsuno, as applied to claim 1, to include a multichamber twin clutch axle including wherein a pair of clutches is adapted to drive a pair of rear axles and includes a ball ramp operator, as taught by Knowles et al., to provide a twin clutch axle which exhibits exceptional torque throughput and quiet operation.

7. Claims 6 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shibahata and Matsuno, as applied to claim 1, in view of Raad et al. (5,029,660).

Shibahata and Matsuno, as applied to claim 1, teaches the claimed limitations except wherein said microprocessor includes a PWM driver circuit adapted to drive electromagnetic operators in said clutches, and wherein the microprocessor includes a proportional integral derivative controller.

Raad et al. teaches a steering control system and method wherein the microprocessor (36) includes a PWM driver circuit (56) adaptable to drive electromagnetic operators in clutches, see column 4, lines 19-22 where Raad et al. teaches using PWM signals to control the coil of a solenoid, and wherein the microprocessor (36) includes a proportional integral derivative controller (78), to accurately control steering assist levels under a wide variety of system operating conditions.

It would have been obvious to one of ordinary skill at the time of the invention to modify the apparatus for controlling yaw in a motor vehicle of Shibahata and Matsuno, as applied to claim 1, to include a steering control system and method wherein the microprocessor includes a PWM driver circuit adaptable to drive electromagnetic operators in clutches, and wherein the microprocessor includes a proportional integral derivative controller, as taught by Raad et al., to accurately control steering assist levels under a wide variety of system operating conditions.

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Note, the operation of the invention taught by Shibahata, Matsuno, and Raad et al., as applied above is understood to teach the methods presented in claims 9-20.

Conclusion

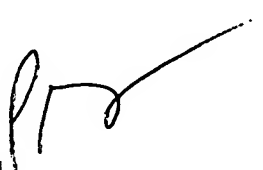
8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Imaseki et al. teaches a torque control system. Kobayashi teaches a power transmission system. Shirakawa et al. teaches a differential control system. Tatara et al. teaches a drive force distribution apparatus. Perlick et al. (PG Pub) teaches steering angle control.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul Royal whose telephone number is 703-308-8570. The examiner can normally be reached on 8:30-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lesley D. Morris can be reached on 703-308-0629. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.


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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



P. Royal
9/19/04

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